



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 2, 2024 – 10:49 AM EDT

PDB ID : 4XP5  
Title : X-ray structure of Drosophila dopamine transporter bound to cocaine analogue-RTI55  
Authors : Gouaux, E.; Penmatsa, A.; Wang, K.  
Deposited on : 2015-01-16  
Resolution : 3.30 Å (reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 1.20.1  
EDS : 3.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.003 (Gargrove)  
Density-Fitness : 1.0.11  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

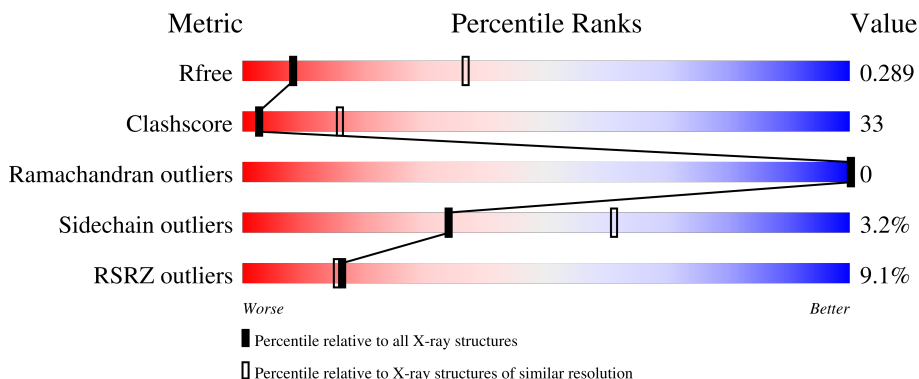
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*


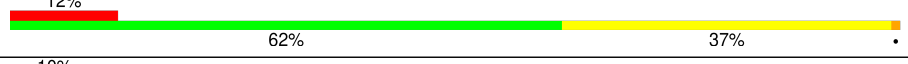
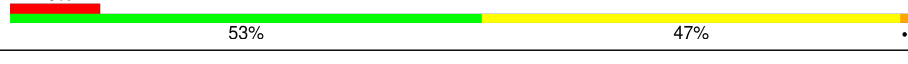

The reported resolution of this entry is 3.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	164625	1085 (3.32-3.28)
Clashscore	180529	1128 (3.32-3.28)
Ramachandran outliers	177936	1125 (3.32-3.28)
Sidechain outliers	177891	1124 (3.32-3.28)
RSRZ outliers	164620	1085 (3.32-3.28)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	534	
2	L	213	
3	H	219	
4	B	2	

## 2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 7531 atoms, of which 18 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Dopamine transporter, isoform B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	534	4171	2803	636	714	18	0	1	0

There are 43 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	74	ALA	VAL	engineered mutation	UNP A0A0B4KEX2
A	?	-	SER	deletion	UNP A0A0B4KEX2
A	?	-	GLN	deletion	UNP A0A0B4KEX2
A	?	-	ASN	deletion	UNP A0A0B4KEX2
A	?	-	ALA	deletion	UNP A0A0B4KEX2
A	?	-	SER	deletion	UNP A0A0B4KEX2
A	?	-	ARG	deletion	UNP A0A0B4KEX2
A	?	-	VAL	deletion	UNP A0A0B4KEX2
A	?	-	PRO	deletion	UNP A0A0B4KEX2
A	?	-	VAL	deletion	UNP A0A0B4KEX2
A	?	-	ILE	deletion	UNP A0A0B4KEX2
A	?	-	GLY	deletion	UNP A0A0B4KEX2
A	?	-	ASN	deletion	UNP A0A0B4KEX2
A	?	-	TYR	deletion	UNP A0A0B4KEX2
A	?	-	SER	deletion	UNP A0A0B4KEX2
A	?	-	ASP	deletion	UNP A0A0B4KEX2
A	?	-	LEU	deletion	UNP A0A0B4KEX2
A	?	-	TYR	deletion	UNP A0A0B4KEX2
A	?	-	ALA	deletion	UNP A0A0B4KEX2
A	?	-	MET	deletion	UNP A0A0B4KEX2
A	?	-	GLY	deletion	UNP A0A0B4KEX2
A	?	-	ASN	deletion	UNP A0A0B4KEX2
A	?	-	GLN	deletion	UNP A0A0B4KEX2
A	?	-	SER	deletion	UNP A0A0B4KEX2
A	?	-	LEU	deletion	UNP A0A0B4KEX2
A	?	-	LEU	deletion	UNP A0A0B4KEX2
A	?	-	TYR	deletion	UNP A0A0B4KEX2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	ASN	deletion	UNP A0A0B4KEX2
A	?	-	GLU	deletion	UNP A0A0B4KEX2
A	?	-	THR	deletion	UNP A0A0B4KEX2
A	?	-	TYR	deletion	UNP A0A0B4KEX2
A	?	-	MET	deletion	UNP A0A0B4KEX2
A	?	-	ASN	deletion	UNP A0A0B4KEX2
A	?	-	GLY	deletion	UNP A0A0B4KEX2
A	?	-	SER	deletion	UNP A0A0B4KEX2
A	?	-	SER	deletion	UNP A0A0B4KEX2
A	?	-	LEU	deletion	UNP A0A0B4KEX2
A	?	-	ASP	deletion	UNP A0A0B4KEX2
A	?	-	THR	deletion	UNP A0A0B4KEX2
A	?	-	SER	deletion	UNP A0A0B4KEX2
A	?	-	ALA	deletion	UNP A0A0B4KEX2
A	?	-	VAL	deletion	UNP A0A0B4KEX2
A	415	ALA	LEU	engineered mutation	UNP A0A0B4KEX2

- Molecule 2 is a protein called Antibody fragment heavy chain-protein, 9D5-heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	L	213	1601	999	263	331	8	0	0	0

- Molecule 3 is a protein called Ighg protein.

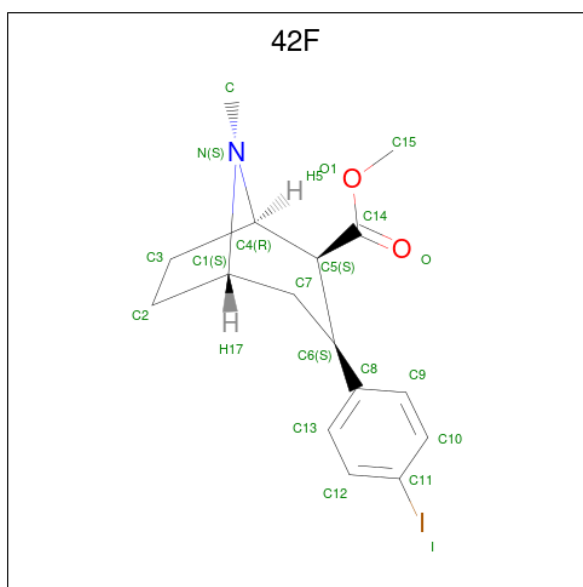
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	H	219	1628	1024	275	321	8	0	0	0

- Molecule 4 is an oligosaccharide called alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose.



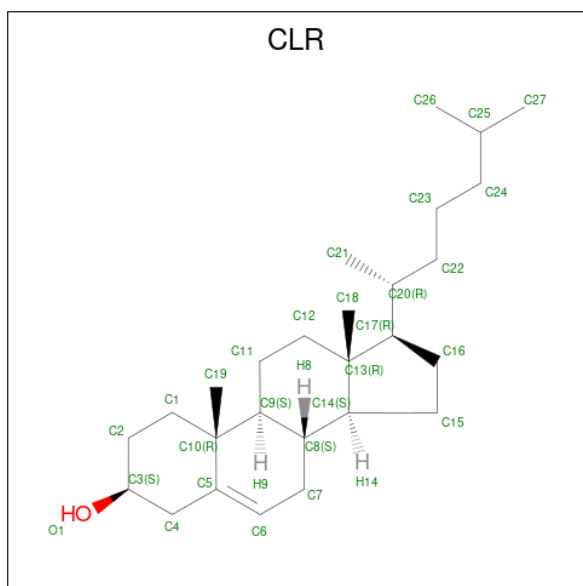
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace
			Total	C	O			
4	B	2	23	12	11	0	0	0

- Molecule 5 is methyl (1R,2S,3S,5S)-3-(4-iodophenyl)-8-methyl-8-azabicyclo[3.2.1]octane-2-carboxylate (three-letter code: 42F) (formula: C<sub>16</sub>H<sub>20</sub>INO<sub>2</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	I	N	O	0	0
			20	16	1	1	2		

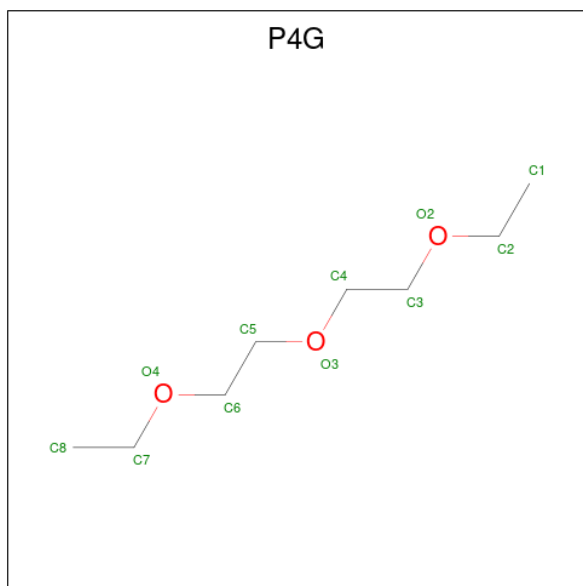
- Molecule 6 is CHOLESTEROL (three-letter code: CLR) (formula:  $C_{27}H_{46}O$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			28	27	1		
6	A	1	Total	C	O	0	0
			28	27	1		

- Molecule 7 is 1-ETHOXY-2-(2-ETHOXYETHOXY)ETHANE (three-letter code: P4G)

(formula: C<sub>8</sub>H<sub>18</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
7	A	1	Total	C	H	O	0	0
			29	8	18	3		

- Molecule 8 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	2	Total	Na	0	0
			2	2		

- Molecule 9 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	1	Total	Cl	0	0
			1	1		

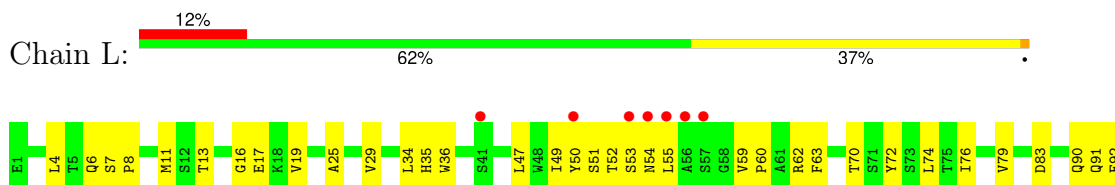
### 3 Residue-property plots i

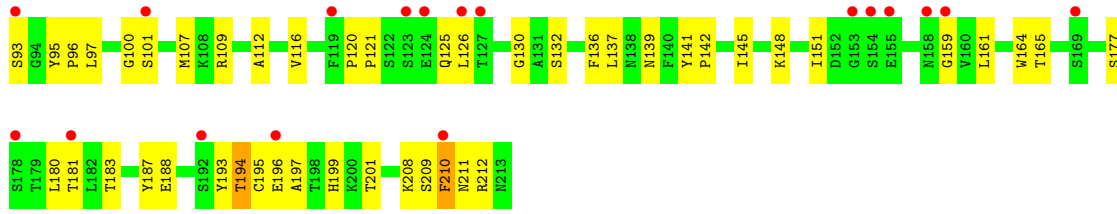
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Dopamine transporter, isoform B

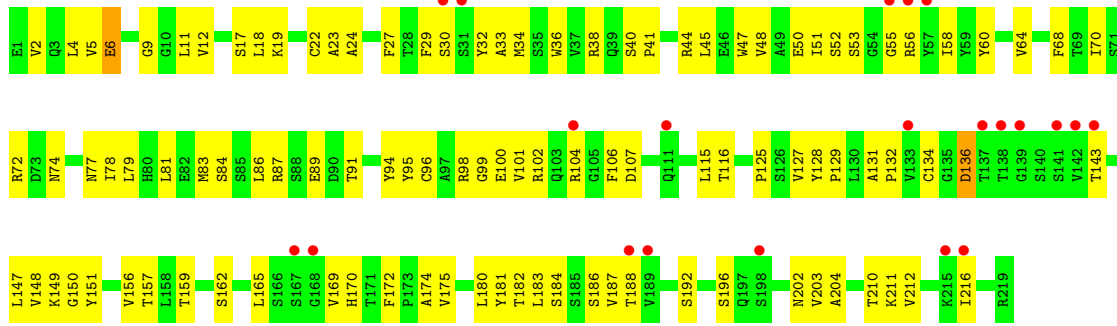


- Molecule 2: Antibody fragment heavy chain-protein, 9D5-heavy chain





● Molecule 3: Ighg protein



● Molecule 4: alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	95.25Å 137.98Å 163.39Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.28 – 3.30 47.28 – 3.30	Depositor EDS
% Data completeness (in resolution range)	86.2 (47.28-3.30) 86.2 (47.28-3.30)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.80 (at 3.33Å)	Xtrriage
Refinement program	PHENIX	Depositor
R, $R_{free}$	0.245 , 0.286 0.253 , 0.289	Depositor DCC
$R_{free}$ test set	1442 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	80.2	Xtrriage
Anisotropy	0.008	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.29 , 31.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.86	EDS
Total number of atoms	7531	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	72.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.18% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: P4G, CLR, GLC, 42F, CL, NA

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.23	0/4318	0.39	0/5916
2	L	0.23	0/1639	0.39	0/2231
3	H	0.23	0/1667	0.41	0/2275
All	All	0.23	0/7624	0.40	0/10422

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4171	0	4020	304	0
2	L	1601	0	1501	84	0
3	H	1628	0	1564	109	0
4	B	23	0	21	3	0
5	A	20	0	20	3	0
6	A	56	0	92	14	0
7	A	11	18	18	0	0
8	A	2	0	0	0	0
9	A	1	0	0	1	0
All	All	7513	18	7236	480	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 33.

All (480) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:75:VAL:HB	1:A:526:VAL:HG11	1.38	1.05
3:H:157:THR:HB	3:H:204:ALA:HB3	1.37	1.02
1:A:95:ALA:HA	1:A:329:LEU:HD23	1.42	0.97
1:A:115:LEU:HD11	1:A:567:SER:HA	1.48	0.94
1:A:73:LEU:HA	1:A:317:VAL:HG11	1.50	0.93
1:A:358:ILE:HG21	6:A:605:CLR:H272	1.51	0.91
1:A:591:THR:HA	1:A:594:THR:HG22	1.53	0.88
3:H:51:ILE:HD13	3:H:72:ARG:HB2	1.58	0.84
1:A:303:ALA:HB1	1:A:309:VAL:HG21	1.58	0.84
1:A:105:LEU:HD13	1:A:593:LEU:HD23	1.58	0.84
3:H:150:GLY:HA2	3:H:180:LEU:HD13	1.58	0.83
1:A:97:THR:HG23	1:A:436:GLU:HG2	1.60	0.82
1:A:282:ARG:HD3	1:A:406:TRP:CZ2	2.14	0.82
3:H:34:MET:HB3	3:H:79:LEU:HD22	1.59	0.81
1:A:444:ARG:HG2	1:A:445:GLU:H	1.46	0.81
3:H:129:PRO:HB2	3:H:216:ILE:HG21	1.62	0.80
1:A:518:TYR:CD2	6:A:603:CLR:H42	2.18	0.79
2:L:161:LEU:HD13	3:H:182:THR:HB	1.65	0.79
3:H:83:MET:HB3	3:H:86:LEU:HD21	1.65	0.79
1:A:258:ILE:HA	1:A:261:SER:HB3	1.63	0.78
1:A:85:LEU:HD23	1:A:328:LEU:HB3	1.66	0.78
1:A:527:ALA:HB3	1:A:528:PRO:HD3	1.67	0.76
1:A:47:LEU:HD13	1:A:127:ILE:HG21	1.67	0.76
2:L:29:VAL:HG13	2:L:93:SER:HB3	1.66	0.75
1:A:582:THR:HG21	1:A:593:LEU:HD13	1.68	0.75
1:A:53:PHE:HB3	1:A:54:PRO:HD3	1.69	0.74
1:A:251:TYR:CE2	1:A:448:VAL:HG23	2.23	0.74
3:H:40:SER:HB2	3:H:41:PRO:HD2	1.68	0.74
3:H:30:SER:O	3:H:53:SER:HB2	1.88	0.73
3:H:125:PRO:HB3	3:H:151:TYR:HB3	1.69	0.73
1:A:596:PRO:HB2	1:A:598:ARG:CD	2.19	0.72
2:L:148:LYS:HB3	2:L:196:GLU:HG2	1.70	0.72
1:A:293:ILE:HD12	1:A:361:PHE:HD1	1.55	0.71
1:A:89:GLN:HA	1:A:333:SER:HA	1.72	0.71
1:A:369:TYR:CZ	1:A:373:THR:HG21	2.26	0.71
1:A:444:ARG:HG2	1:A:445:GLU:N	2.06	0.70
2:L:51:SER:OG	2:L:54:ASN:ND2	2.21	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:H:32:TYR:O	3:H:72:ARG:NH2	2.24	0.70
1:A:106:PHE:HD2	1:A:493:ALA:HB2	1.57	0.70
2:L:151:ILE:HG22	2:L:193:TYR:HD1	1.56	0.70
1:A:41:ILE:HD11	1:A:348:THR:HA	1.74	0.69
1:A:591:THR:HA	1:A:594:THR:CG2	2.21	0.69
1:A:518:TYR:HD2	6:A:603:CLR:H42	1.55	0.69
1:A:75:VAL:O	1:A:79:PRO:HG2	1.92	0.69
1:A:101:ARG:HG3	1:A:597:TRP:CB	2.23	0.69
1:A:123:TYR:HB3	1:A:474:LEU:HD12	1.75	0.68
1:A:40:VAL:HG12	1:A:348:THR:HG21	1.75	0.67
1:A:94:GLY:N	1:A:435:ASP:OD2	2.27	0.67
2:L:92:PHE:CD2	3:H:102:ARG:HA	2.30	0.67
2:L:92:PHE:HD2	3:H:102:ARG:HA	1.57	0.67
1:A:255:TRP:CD1	1:A:445:GLU:HB3	2.30	0.66
1:A:258:ILE:HD13	1:A:334:TYR:CG	2.31	0.66
1:A:115:LEU:HD11	1:A:567:SER:CA	2.23	0.66
1:A:487:VAL:HG12	1:A:531:LEU:HD11	1.78	0.66
3:H:34:MET:HG2	3:H:72:ARG:HH12	1.61	0.65
1:A:251:TYR:OH	1:A:445:GLU:O	2.06	0.65
3:H:91:THR:HG23	3:H:116:THR:HA	1.78	0.65
1:A:393:TYR:HB3	1:A:394:PRO:HD3	1.79	0.65
1:A:369:TYR:CE1	1:A:373:THR:HG21	2.32	0.65
1:A:244:LEU:HB2	1:A:456:PHE:CE1	2.32	0.64
3:H:51:ILE:CD1	3:H:72:ARG:HB2	2.26	0.64
1:A:85:LEU:CD2	1:A:328:LEU:HB3	2.27	0.64
6:A:603:CLR:H121	6:A:603:CLR:H212	1.79	0.64
1:A:271:PHE:HB3	1:A:272:PRO:HD3	1.80	0.64
1:A:367:LEU:HA	1:A:370:MET:HE2	1.79	0.63
1:A:369:TYR:O	1:A:373:THR:HG22	1.98	0.63
2:L:148:LYS:HB3	2:L:196:GLU:CG	2.27	0.63
2:L:161:LEU:CD1	3:H:182:THR:HB	2.28	0.63
3:H:148:VAL:O	3:H:183:LEU:N	2.21	0.62
1:A:351:ILE:HD13	6:A:605:CLR:H71	1.81	0.62
1:A:507:ILE:HD12	1:A:515:PRO:HG3	1.81	0.62
6:A:603:CLR:H263	6:A:603:CLR:H222	1.81	0.62
1:A:572:PRO:O	1:A:576:ILE:HG12	2.00	0.62
1:A:60:ASN:O	1:A:65:PHE:HB2	1.99	0.62
1:A:143:LEU:O	1:A:146:THR:HG22	2.00	0.62
2:L:145:ILE:H	2:L:164:TRP:HH2	1.47	0.61
3:H:79:LEU:HD23	3:H:96:CYS:SG	2.40	0.61
1:A:245:ILE:O	1:A:249:ILE:HG13	2.00	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:488:PHE:HA	1:A:531:LEU:HD12	1.82	0.61
1:A:101:ARG:HG3	1:A:597:TRP:HB2	1.82	0.61
3:H:165:LEU:HD12	3:H:165:LEU:O	2.01	0.61
1:A:570:MET:CE	1:A:570:MET:HA	2.30	0.61
2:L:126:LEU:HD12	2:L:126:LEU:H	1.65	0.61
2:L:165:THR:HG23	3:H:172:PHE:CD2	2.36	0.61
1:A:38:LEU:HD21	6:A:605:CLR:H191	1.83	0.60
2:L:34:LEU:HD13	2:L:72:TYR:CG	2.36	0.60
3:H:183:LEU:HD23	3:H:184:SER:N	2.16	0.60
1:A:111:TYR:HD2	1:A:574:VAL:HG21	1.66	0.60
1:A:522:CYS:HA	1:A:526:VAL:HB	1.83	0.60
1:A:255:TRP:NE1	1:A:445:GLU:HB3	2.17	0.60
3:H:34:MET:CB	3:H:79:LEU:HD22	2.30	0.60
1:A:71:ILE:O	1:A:75:VAL:HG22	2.01	0.60
1:A:351:ILE:HD13	6:A:605:CLR:C7	2.32	0.59
1:A:293:ILE:HD12	1:A:361:PHE:CD1	2.35	0.59
1:A:511:ILE:HD12	1:A:513:PHE:CZ	2.37	0.59
1:A:596:PRO:HB2	1:A:598:ARG:HD3	1.84	0.59
1:A:455:TYR:O	1:A:459:GLY:N	2.34	0.59
1:A:489:PHE:HD2	1:A:571:ILE:HD13	1.68	0.59
2:L:7:SER:HA	2:L:8:PRO:C	2.22	0.59
2:L:141:TYR:CG	2:L:142:PRO:HA	2.38	0.59
1:A:591:THR:CA	1:A:594:THR:HG22	2.30	0.59
2:L:194:THR:HG23	2:L:209:SER:HA	1.84	0.59
2:L:116:VAL:O	2:L:208:LYS:HE3	2.03	0.58
1:A:268:THR:OG1	1:A:420:ASP:HB3	2.02	0.58
2:L:34:LEU:HD13	2:L:72:TYR:CD1	2.38	0.58
1:A:144:PRO:HB2	1:A:215:TYR:CE2	2.38	0.58
2:L:199:HIS:CE1	2:L:201:THR:HG23	2.38	0.58
1:A:27:ARG:HH12	1:A:333:SER:C	2.07	0.58
1:A:393:TYR:CE2	1:A:397:ILE:HD11	2.38	0.58
2:L:8:PRO:HG2	2:L:11:MET:HB2	1.86	0.58
2:L:121:PRO:HG2	2:L:187:TYR:CE1	2.38	0.58
2:L:137:LEU:HD23	2:L:145:ILE:HD13	1.86	0.58
1:A:304:ILE:O	1:A:310:TRP:NE1	2.32	0.58
3:H:5:VAL:O	3:H:23:ALA:N	2.29	0.58
2:L:187:TYR:O	2:L:193:TYR:OH	2.20	0.58
1:A:529:ILE:O	1:A:533:PHE:N	2.36	0.58
1:A:537:TYR:O	1:A:540:ILE:HG22	2.04	0.58
1:A:440:ILE:HD12	1:A:441:LYS:N	2.19	0.57
1:A:507:ILE:HD12	1:A:515:PRO:CG	2.33	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:43:PHE:HA	1:A:421:SER:HA	1.85	0.57
1:A:370:MET:HG2	1:A:374:LEU:HD12	1.86	0.57
2:L:151:ILE:HG22	2:L:193:TYR:CD1	2.39	0.57
3:H:48:VAL:HG13	3:H:64:VAL:HG21	1.86	0.57
1:A:114:VAL:HG13	1:A:429:ILE:HA	1.86	0.57
1:A:434:SER:HA	1:A:440:ILE:CD1	2.34	0.57
2:L:120:PRO:HB3	2:L:210:PHE:CZ	2.39	0.57
2:L:47:LEU:HB2	3:H:106:PHE:O	2.05	0.57
1:A:433:LEU:O	1:A:440:ILE:HD11	2.04	0.57
1:A:570:MET:HA	1:A:570:MET:HE3	1.85	0.57
1:A:361:PHE:O	1:A:365:SER:HB2	2.05	0.57
1:A:546:THR:CG2	1:A:551:VAL:HG12	2.35	0.57
1:A:72:MET:CE	1:A:72:MET:HA	2.35	0.57
1:A:370:MET:SD	1:A:396:ALA:HB2	2.45	0.57
1:A:117:ALA:HB3	1:A:429:ILE:HD11	1.85	0.57
1:A:92:ARG:NH2	1:A:335:ASN:O	2.38	0.56
1:A:292:GLY:HA3	1:A:364:PHE:O	2.05	0.56
2:L:92:PHE:HD2	3:H:102:ARG:CA	2.18	0.56
3:H:159:THR:OG1	3:H:202:ASN:OD1	2.22	0.56
1:A:99:TRP:CZ2	1:A:490:GLU:HG2	2.41	0.56
6:A:605:CLR:H121	6:A:605:CLR:H212	1.86	0.56
3:H:33:ALA:HB3	3:H:99:GLY:O	2.06	0.56
3:H:136:ASP:N	3:H:136:ASP:OD1	2.39	0.56
1:A:35:ASP:O	1:A:39:SER:HB2	2.05	0.56
1:A:286:LEU:HD23	1:A:369:TYR:CG	2.41	0.56
3:H:143:THR:OG1	3:H:188:THR:HG22	2.06	0.56
1:A:87:LEU:HD23	1:A:91:ASN:ND2	2.20	0.56
1:A:518:TYR:CE2	6:A:603:CLR:H42	2.41	0.56
1:A:27:ARG:NH2	1:A:333:SER:OG	2.30	0.56
1:A:115:LEU:HA	1:A:118:PHE:HB3	1.88	0.56
1:A:75:VAL:HG23	1:A:76:GLY:N	2.21	0.56
1:A:311:VAL:O	1:A:315:THR:OG1	2.24	0.56
1:A:150:ASN:N	1:A:153:ASN:OD1	2.38	0.55
1:A:341:VAL:HG13	1:A:342:TYR:H	1.70	0.55
1:A:297:LEU:HD11	1:A:361:PHE:CZ	2.42	0.55
1:A:370:MET:HE1	1:A:381:VAL:HB	1.89	0.55
1:A:241:LEU:O	1:A:245:ILE:HG13	2.07	0.54
2:L:19:VAL:HG22	2:L:76:ILE:HB	1.89	0.54
2:L:136:PHE:CD2	3:H:186:SER:HB3	2.42	0.54
4:B:1:GLC:HO2	4:B:2:GLC:HO2	1.54	0.54
1:A:512:GLY:HA2	3:H:102:ARG:NH2	2.22	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:H:40:SER:OG	3:H:44:ARG:HB3	2.07	0.54
2:L:6:GLN:H	2:L:101:SER:HB3	1.72	0.54
4:B:1:GLC:O2	4:B:2:GLC:O2	2.21	0.54
1:A:366:VAL:HG21	1:A:393:TYR:CE1	2.43	0.54
1:A:545:LEU:HG	1:A:552:TYR:CD1	2.42	0.54
3:H:125:PRO:CB	3:H:151:TYR:HB3	2.35	0.54
1:A:240:ALA:HA	1:A:463:CYS:SG	2.47	0.54
1:A:61:GLY:O	1:A:299:PRO:HA	2.08	0.54
1:A:78:ILE:HB	1:A:79:PRO:HD3	1.90	0.54
1:A:242:CYS:O	1:A:246:VAL:HG23	2.07	0.54
1:A:251:TYR:HD1	1:A:252:PHE:HD1	1.54	0.54
2:L:181:THR:HG21	3:H:149:LYS:NZ	2.23	0.54
3:H:210:THR:C	3:H:211:LYS:HD2	2.28	0.54
1:A:598:ARG:HD3	1:A:598:ARG:H	1.73	0.53
1:A:219:TYR:HD1	1:A:220:ILE:HD13	1.73	0.53
1:A:80:LEU:CD1	1:A:531:LEU:HD21	2.37	0.53
2:L:50:TYR:O	2:L:54:ASN:HB2	2.08	0.53
1:A:80:LEU:HD21	1:A:527:ALA:HB1	1.90	0.53
1:A:105:LEU:CD1	1:A:593:LEU:HD23	2.32	0.53
1:A:598:ARG:NH2	3:H:56:ARG:HD2	2.24	0.53
1:A:260:THR:O	1:A:264:VAL:HG23	2.08	0.53
1:A:137:ALA:HA	4:B:1:GLC:H62	1.90	0.53
1:A:341:VAL:HG13	1:A:342:TYR:N	2.24	0.53
2:L:92:PHE:CE1	2:L:97:LEU:HD13	2.44	0.53
3:H:127:VAL:CG1	3:H:203:VAL:HG21	2.39	0.53
1:A:106:PHE:CD2	1:A:493:ALA:HB2	2.41	0.53
1:A:351:ILE:CD1	6:A:605:CLR:H71	2.39	0.53
2:L:97:LEU:HD12	3:H:47:TRP:CD1	2.44	0.53
3:H:17:SER:HB2	3:H:83:MET:O	2.09	0.53
1:A:553:PRO:HB2	1:A:555:TRP:CD1	2.44	0.52
2:L:125:GLN:HG2	2:L:130:GLY:O	2.09	0.52
1:A:161:GLU:HA	1:A:210:SER:HB3	1.90	0.52
1:A:112:ALA:O	1:A:116:ILE:HG13	2.09	0.52
3:H:33:ALA:N	3:H:100:GLU:OE1	2.39	0.52
1:A:218:ARG:HA	1:A:224:ASN:OD1	2.10	0.52
1:A:48:ALA:O	1:A:52:ARG:HB3	2.09	0.52
1:A:77:GLY:HA3	1:A:317:VAL:HG12	1.92	0.52
1:A:80:LEU:HD11	1:A:531:LEU:HD21	1.91	0.52
3:H:12:VAL:HG11	3:H:86:LEU:HD12	1.91	0.52
1:A:97:THR:O	1:A:101:ARG:HB2	2.10	0.52
1:A:154:THR:HG22	1:A:156:ASN:H	1.75	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:282:ARG:HD3	1:A:406:TRP:CH2	2.44	0.52
1:A:43:PHE:CE1	1:A:327:VAL:HG21	2.45	0.51
1:A:150:ASN:N	1:A:150:ASN:OD1	2.42	0.51
2:L:29:VAL:O	2:L:72:TYR:OH	2.28	0.51
1:A:36:PHE:CE1	1:A:332:ALA:HA	2.44	0.51
1:A:73:LEU:HD23	6:A:603:CLR:H20	1.91	0.51
1:A:546:THR:HG22	1:A:551:VAL:HG12	1.93	0.51
1:A:571:ILE:HB	1:A:572:PRO:CD	2.41	0.51
2:L:97:LEU:HB2	3:H:47:TRP:CG	2.46	0.51
1:A:119:TYR:OH	1:A:566:SER:OG	2.19	0.51
1:A:342:TYR:O	1:A:346:LEU:HG	2.11	0.51
1:A:578:LYS:CB	1:A:593:LEU:HD21	2.40	0.51
1:A:517:ARG:O	1:A:521:VAL:HG23	2.09	0.51
2:L:211:ASN:OD1	2:L:212:ARG:N	2.43	0.51
3:H:9:GLY:HA2	3:H:18:LEU:HD21	1.93	0.51
1:A:154:THR:CG2	1:A:155:PRO:HD2	2.41	0.51
1:A:488:PHE:O	1:A:492:ILE:HG12	2.11	0.51
3:H:64:VAL:HB	3:H:68:PHE:CD2	2.46	0.51
2:L:137:LEU:HD12	2:L:137:LEU:N	2.26	0.50
1:A:496[A]:TRP:HA	1:A:496[A]:TRP:CE3	2.46	0.50
1:A:508:ARG:HD3	1:A:508:ARG:C	2.31	0.50
2:L:34:LEU:HG	2:L:90:GLN:O	2.10	0.50
3:H:98:ARG:O	3:H:98:ARG:HG3	2.12	0.50
1:A:43:PHE:HE2	1:A:322:GLY:HA3	1.76	0.50
1:A:154:THR:OG1	1:A:218:ARG:NH1	2.44	0.50
1:A:512:GLY:HA2	3:H:102:ARG:HH21	1.76	0.50
2:L:62:ARG:NH1	2:L:83:ASP:OD1	2.45	0.50
3:H:2:VAL:HG13	3:H:27:PHE:CD1	2.47	0.50
1:A:67:VAL:HB	1:A:68:PRO:HD3	1.94	0.50
1:A:83:MET:O	1:A:87:LEU:HB2	2.12	0.50
1:A:415:ALA:O	1:A:419:LEU:HG	2.12	0.50
1:A:433:LEU:HD12	1:A:447:PHE:CZ	2.46	0.50
1:A:47:LEU:CD1	1:A:127:ILE:HG21	2.37	0.50
2:L:16:GLY:N	2:L:79:VAL:O	2.38	0.50
3:H:24:ALA:HB1	3:H:27:PHE:CZ	2.47	0.50
1:A:59:LYS:HG2	1:A:60:ASN:OD1	2.12	0.50
1:A:508:ARG:NH2	3:H:50:GLU:OE2	2.43	0.50
3:H:81:LEU:HD23	3:H:83:MET:HE3	1.93	0.50
1:A:487:VAL:HA	1:A:490:GLU:HB2	1.93	0.50
1:A:505:GLU:HG3	3:H:52:SER:OG	2.12	0.50
2:L:52:THR:HG21	2:L:72:TYR:HD2	1.76	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:43:PHE:CD1	1:A:327:VAL:HG11	2.47	0.49
2:L:177:SER:HB2	3:H:172:PHE:CD1	2.47	0.49
3:H:101:VAL:HG12	3:H:104:ARG:H	1.76	0.49
3:H:151:TYR:OH	3:H:174:ALA:HB2	2.12	0.49
1:A:73:LEU:CD1	1:A:317:VAL:HG13	2.42	0.49
1:A:440:ILE:HA	1:A:443:ASN:CB	2.42	0.49
1:A:147:SER:HB2	1:A:150:ASN:OD1	2.12	0.49
1:A:376:VAL:HG21	1:A:381:VAL:HG13	1.95	0.49
1:A:420:ASP:N	1:A:420:ASP:OD1	2.45	0.49
1:A:559:LEU:O	1:A:563:ILE:HG13	2.13	0.49
2:L:4:LEU:CD2	2:L:25:ALA:HB2	2.42	0.49
3:H:127:VAL:HG12	3:H:203:VAL:HG21	1.93	0.49
1:A:93:LYS:HG3	1:A:435:ASP:HB3	1.94	0.49
1:A:341:VAL:O	1:A:345:ALA:N	2.41	0.49
3:H:101:VAL:HG11	3:H:104:ARG:HG3	1.93	0.49
3:H:156:VAL:CG2	3:H:183:LEU:HD13	2.42	0.49
1:A:73:LEU:HD12	1:A:317:VAL:HG13	1.94	0.49
1:A:47:LEU:HD13	1:A:127:ILE:CG2	2.41	0.49
1:A:71:ILE:HD12	1:A:310:TRP:HH2	1.77	0.49
1:A:96:ILE:HD13	1:A:111:TYR:CE1	2.47	0.49
1:A:568:VAL:O	1:A:572:PRO:HD2	2.13	0.49
1:A:51:TRP:HA	1:A:388:LEU:HD23	1.94	0.49
1:A:68:PRO:HD3	1:A:304:ILE:CD1	2.42	0.49
1:A:121:ASP:O	1:A:125:ASN:ND2	2.45	0.49
1:A:588:GLN:O	1:A:592:ILE:HG22	2.12	0.49
3:H:83:MET:CB	3:H:86:LEU:HD21	2.40	0.49
1:A:52:ARG:CZ	1:A:56:LEU:HD21	2.42	0.48
1:A:508:ARG:HD3	1:A:508:ARG:O	2.13	0.48
2:L:92:PHE:HZ	3:H:106:PHE:CE1	2.31	0.48
1:A:90:HIS:HB2	1:A:510:MET:SD	2.53	0.48
3:H:129:PRO:HB2	3:H:216:ILE:CG2	2.37	0.48
1:A:283:GLY:O	1:A:286:LEU:HB2	2.12	0.48
3:H:24:ALA:HB3	3:H:29:PHE:CD1	2.48	0.48
2:L:188:GLU:N	2:L:188:GLU:OE1	2.47	0.48
3:H:18:LEU:HD12	3:H:19:LYS:H	1.78	0.48
1:A:255:TRP:HE1	1:A:445:GLU:HB3	1.77	0.48
1:A:330:ALA:O	1:A:333:SER:OG	2.25	0.48
1:A:49:ASN:ND2	1:A:356:SER:OG	2.47	0.48
1:A:223:LEU:HA	1:A:465:GLN:O	2.13	0.48
3:H:17:SER:HB3	3:H:84:SER:HA	1.96	0.48
1:A:258:ILE:HG21	1:A:334:TYR:CD2	2.49	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:430:ILE:HD11	1:A:448:VAL:HG12	1.95	0.48
3:H:60:TYR:OH	3:H:70:ILE:HG22	2.14	0.48
1:A:108:GLY:HA2	1:A:574:VAL:HG21	1.96	0.48
1:A:71:ILE:HD12	1:A:310:TRP:CH2	2.48	0.48
1:A:354:ALA:O	1:A:358:ILE:HG12	2.13	0.48
1:A:128:ILE:HG23	1:A:415:ALA:HA	1.95	0.47
2:L:60:PRO:HG2	2:L:63:PHE:CD2	2.49	0.47
1:A:41:ILE:CD1	1:A:348:THR:HA	2.44	0.47
1:A:373:THR:HG23	1:A:374:LEU:HG	1.95	0.47
1:A:454:LEU:HD23	1:A:454:LEU:O	2.15	0.47
1:A:376:VAL:CG2	1:A:381:VAL:HG13	2.44	0.47
1:A:444:ARG:C	1:A:446:LEU:H	2.17	0.47
3:H:127:VAL:HG21	3:H:212:VAL:HG11	1.96	0.47
3:H:192:SER:O	3:H:196:SER:OG	2.20	0.47
1:A:331:TYR:CZ	1:A:424:GLY:HA2	2.49	0.47
1:A:315:THR:HA	1:A:534:ILE:HD13	1.96	0.47
1:A:433:LEU:C	1:A:440:ILE:HD11	2.35	0.47
2:L:109:ARG:NH2	2:L:112:ALA:HB2	2.29	0.47
2:L:161:LEU:HD11	3:H:175:VAL:HB	1.96	0.47
1:A:255:TRP:O	1:A:445:GLU:HG2	2.15	0.47
2:L:4:LEU:O	2:L:100:GLY:HA2	2.14	0.47
1:A:43:PHE:CE2	1:A:322:GLY:HA3	2.49	0.47
2:L:159:GLY:O	2:L:180:LEU:HD12	2.15	0.47
3:H:148:VAL:HB	3:H:183:LEU:HB3	1.96	0.47
1:A:54:PRO:HG3	1:A:360:GLY:HA2	1.97	0.46
1:A:115:LEU:HD11	1:A:567:SER:CB	2.45	0.46
1:A:496[A]:TRP:HA	1:A:496[A]:TRP:HE3	1.80	0.46
1:A:571:ILE:HB	1:A:572:PRO:HD3	1.96	0.46
2:L:90:GLN:HG2	2:L:91:GLN:N	2.31	0.46
3:H:51:ILE:HG13	3:H:58:ILE:CD1	2.44	0.46
1:A:115:LEU:HD12	1:A:116:ILE:N	2.30	0.46
2:L:137:LEU:HD21	2:L:197:ALA:HB2	1.96	0.46
1:A:485:VAL:HG21	1:A:568:VAL:HG21	1.98	0.46
1:A:525:PHE:O	1:A:528:PRO:HD2	2.15	0.46
2:L:52:THR:CG2	2:L:72:TYR:HD2	2.28	0.46
3:H:30:SER:HA	3:H:74:ASN:OD1	2.16	0.46
3:H:148:VAL:N	3:H:183:LEU:O	2.45	0.46
3:H:98:ARG:HA	3:H:99:GLY:HA3	1.58	0.46
1:A:51:TRP:HH2	1:A:127:ILE:HD13	1.81	0.46
1:A:61:GLY:HA2	1:A:300:ASN:HB2	1.97	0.46
1:A:280:LEU:HD11	1:A:284:LEU:HD11	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:311:VAL:HG21	1:A:537:TYR:CD2	2.50	0.46
3:H:22:CYS:N	3:H:79:LEU:O	2.46	0.46
1:A:341:VAL:O	1:A:344:ASP:N	2.48	0.46
1:A:96:ILE:HG21	1:A:111:TYR:CE1	2.51	0.46
1:A:152:TRP:O	1:A:218:ARG:HD3	2.15	0.46
1:A:363:ILE:O	1:A:367:LEU:HD13	2.16	0.46
3:H:127:VAL:HG21	3:H:212:VAL:CG1	2.45	0.46
1:A:340:ASN:HA	1:A:511:ILE:HG22	1.97	0.46
3:H:125:PRO:HB3	3:H:151:TYR:CB	2.40	0.46
3:H:125:PRO:CA	3:H:151:TYR:HB3	2.45	0.46
1:A:61:GLY:O	1:A:64:ALA:HB3	2.16	0.46
1:A:67:VAL:O	1:A:71:ILE:HG13	2.16	0.46
1:A:154:THR:HG23	1:A:155:PRO:HD2	1.97	0.46
1:A:366:VAL:O	1:A:370:MET:HG3	2.16	0.45
2:L:194:THR:HG23	2:L:209:SER:CA	2.45	0.45
1:A:46:ASP:OD1	5:A:602:42F:H11	2.16	0.45
1:A:51:TRP:O	1:A:384:GLU:HA	2.15	0.45
1:A:75:VAL:HG23	1:A:76:GLY:H	1.80	0.45
1:A:445:GLU:HA	1:A:448:VAL:HG22	1.98	0.45
1:A:67:VAL:HB	1:A:68:PRO:CD	2.46	0.45
1:A:77:GLY:HA3	1:A:317:VAL:CG1	2.46	0.45
2:L:13:THR:HG23	2:L:17:GLU:HB3	1.99	0.45
1:A:485:VAL:CG2	1:A:568:VAL:HG21	2.47	0.45
1:A:346:LEU:HD12	1:A:347:LEU:N	2.32	0.45
1:A:235:ILE:HA	1:A:464:THR:HA	1.99	0.45
1:A:526:VAL:O	1:A:529:ILE:HG13	2.17	0.45
3:H:24:ALA:HB3	3:H:29:PHE:HD1	1.82	0.45
1:A:251:TYR:HD1	1:A:252:PHE:CD1	2.33	0.45
2:L:60:PRO:HG2	2:L:63:PHE:HD2	1.81	0.45
2:L:183:THR:O	2:L:187:TYR:N	2.50	0.45
1:A:325:PHE:CZ	5:A:602:42F:H4	2.51	0.45
2:L:116:VAL:HG22	2:L:137:LEU:HG	1.98	0.45
1:A:433:LEU:HD12	1:A:447:PHE:HZ	1.80	0.44
1:A:591:THR:O	1:A:595:THR:HG23	2.16	0.44
2:L:35:HIS:O	2:L:90:GLN:N	2.50	0.44
2:L:60:PRO:HG3	2:L:62:ARG:NH1	2.32	0.44
2:L:148:LYS:HD3	2:L:196:GLU:OE2	2.16	0.44
3:H:51:ILE:CG1	3:H:55:GLY:HA2	2.47	0.44
3:H:87:ARG:HG2	3:H:89:GLU:H	1.82	0.44
3:H:169:VAL:HG22	3:H:187:VAL:HG23	1.98	0.44
1:A:247:TYR:OH	1:A:455:TYR:HB3	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:64:ALA:O	1:A:304:ILE:HD11	2.18	0.44
3:H:128:TYR:HB2	3:H:147:LEU:HB3	1.99	0.44
1:A:96:ILE:HA	1:A:110:GLY:HA3	1.99	0.44
1:A:396:ALA:O	1:A:400:MET:HG3	2.17	0.44
3:H:77:ASN:O	3:H:78:ILE:HD13	2.17	0.44
1:A:598:ARG:HA	1:A:599:ASP:HA	1.59	0.44
2:L:52:THR:HG21	2:L:72:TYR:CD2	2.52	0.44
2:L:126:LEU:HD12	2:L:126:LEU:N	2.32	0.44
3:H:44:ARG:NH1	3:H:45:LEU:O	2.51	0.44
1:A:48:ALA:HA	1:A:51:TRP:NE1	2.33	0.44
1:A:126:VAL:HG21	1:A:462:SER:HB2	2.00	0.44
1:A:274:ALA:O	1:A:278:ILE:HG13	2.18	0.44
1:A:250:CYS:HA	1:A:423:PHE:HE1	1.83	0.44
1:A:156:ASN:HB3	1:A:208:PHE:CD1	2.53	0.43
1:A:393:TYR:HE2	1:A:397:ILE:HD11	1.80	0.43
3:H:11:LEU:HD12	3:H:116:THR:O	2.18	0.43
1:A:103:VAL:HG11	1:A:497:ILE:HG21	2.00	0.43
1:A:412:MET:O	1:A:416:THR:HG23	2.18	0.43
1:A:473:LEU:HA	1:A:545:LEU:HD21	2.00	0.43
2:L:95:TYR:HA	2:L:96:PRO:C	2.38	0.43
2:L:107:MET:HA	2:L:107:MET:CE	2.48	0.43
2:L:161:LEU:O	2:L:161:LEU:HD23	2.18	0.43
3:H:162:SER:H	3:H:202:ASN:ND2	2.16	0.43
2:L:136:PHE:C	2:L:137:LEU:HD12	2.38	0.43
1:A:381:VAL:O	1:A:392:VAL:HG11	2.18	0.43
1:A:487:VAL:O	1:A:490:GLU:HB2	2.18	0.43
1:A:41:ILE:HD12	1:A:351:ILE:HB	1.99	0.43
1:A:215:TYR:CE1	1:A:220:ILE:HD11	2.53	0.43
2:L:107:MET:HA	2:L:107:MET:HE2	2.01	0.43
1:A:228:GLY:HA3	1:A:550:TYR:CE1	2.54	0.43
1:A:544:PRO:O	1:A:546:THR:HG23	2.18	0.43
1:A:320:SER:OG	9:A:607:CL:CL	2.61	0.43
1:A:420:ASP:HA	1:A:423:PHE:CD2	2.54	0.43
2:L:74:LEU:C	2:L:74:LEU:HD23	2.39	0.43
3:H:125:PRO:HB2	3:H:148:VAL:HG13	2.00	0.43
2:L:35:HIS:NE2	3:H:102:ARG:O	2.49	0.43
1:A:87:LEU:HD22	1:A:98:CYS:SG	2.59	0.43
1:A:485:VAL:HG21	1:A:568:VAL:HG11	2.01	0.42
1:A:111:TYR:O	1:A:115:LEU:HG	2.19	0.42
1:A:116:ILE:O	1:A:120:VAL:HG23	2.19	0.42
2:L:19:VAL:HG13	2:L:79:VAL:HG21	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:78:ILE:N	1:A:79:PRO:CD	2.82	0.42
1:A:257:GLY:HA2	1:A:444:ARG:NH2	2.33	0.42
1:A:280:LEU:O	1:A:284:LEU:HG	2.19	0.42
1:A:327:VAL:HA	1:A:428:ALA:HB2	2.01	0.42
2:L:19:VAL:CG1	2:L:79:VAL:HG21	2.50	0.42
2:L:151:ILE:HD12	2:L:151:ILE:O	2.19	0.42
3:H:34:MET:HB3	3:H:34:MET:HE3	1.95	0.42
1:A:48:ALA:HA	1:A:51:TRP:CD1	2.54	0.42
3:H:131:ALA:HA	3:H:132:PRO:HD3	1.91	0.42
1:A:85:LEU:HD22	1:A:332:ALA:HB2	2.02	0.42
2:L:139:ASN:OD1	3:H:170:HIS:NE2	2.48	0.42
1:A:281:ILE:O	1:A:285:THR:HG23	2.19	0.42
1:A:514:PRO:HD2	3:H:101:VAL:HG22	2.01	0.42
6:A:603:CLR:H211	6:A:603:CLR:H232	1.79	0.42
1:A:82:TYR:CD2	1:A:523:TRP:HZ2	2.37	0.42
1:A:115:LEU:HD12	1:A:115:LEU:C	2.40	0.42
1:A:258:ILE:HD13	1:A:334:TYR:CD1	2.55	0.42
1:A:282:ARG:HA	1:A:282:ARG:HD2	1.86	0.42
1:A:447:PHE:O	1:A:451:LEU:N	2.53	0.42
3:H:98:ARG:HG3	3:H:107:ASP:OD1	2.19	0.42
1:A:79:PRO:O	1:A:523:TRP:NE1	2.50	0.41
3:H:36:TRP:HD1	3:H:70:ILE:HD12	1.83	0.41
1:A:141:ASN:O	1:A:141:ASN:ND2	2.52	0.41
1:A:504:SER:HB3	1:A:515:PRO:HD2	2.02	0.41
2:L:137:LEU:HD23	2:L:145:ILE:CD1	2.49	0.41
3:H:18:LEU:HD23	3:H:115:LEU:HD13	2.02	0.41
3:H:99:GLY:N	3:H:106:PHE:HD1	2.16	0.41
1:A:235:ILE:HD13	1:A:460:LEU:HB3	2.02	0.41
1:A:493:ALA:O	1:A:497:ILE:HB	2.19	0.41
3:H:180:LEU:HD12	3:H:180:LEU:O	2.20	0.41
1:A:295:TYR:CE1	1:A:378:ILE:HG21	2.55	0.41
1:A:570:MET:O	1:A:574:VAL:HG23	2.20	0.41
2:L:34:LEU:C	2:L:34:LEU:HD23	2.41	0.41
2:L:55:LEU:HD22	2:L:59:VAL:HG11	2.01	0.41
2:L:92:PHE:HZ	3:H:106:PHE:CZ	2.38	0.41
3:H:127:VAL:CG2	3:H:212:VAL:HG11	2.50	0.41
1:A:208:PHE:N	1:A:208:PHE:HD1	2.19	0.41
1:A:261:SER:O	1:A:265:VAL:HG13	2.20	0.41
1:A:208:PHE:CD1	1:A:208:PHE:N	2.88	0.41
1:A:307:ALA:O	1:A:311:VAL:HG23	2.21	0.41
2:L:25:ALA:O	2:L:70:THR:HB	2.19	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:H:6:GLU:OE1	3:H:95:TYR:HA	2.21	0.41
3:H:170:HIS:HB2	3:H:186:SER:OG	2.21	0.41
1:A:40:VAL:CG1	1:A:348:THR:HG21	2.45	0.41
1:A:101:ARG:HG3	1:A:597:TRP:CG	2.55	0.41
2:L:36:TRP:HB2	2:L:49:ILE:HB	2.02	0.41
3:H:83:MET:HB3	3:H:86:LEU:CD2	2.43	0.41
1:A:596:PRO:HB2	1:A:598:ARG:NE	2.34	0.41
1:A:96:ILE:HB	1:A:436:GLU:HG3	2.03	0.41
1:A:110:GLY:O	1:A:114:VAL:HG23	2.20	0.41
1:A:145:TRP:HB2	1:A:212:ALA:HA	2.03	0.41
1:A:364:PHE:HA	1:A:367:LEU:HB2	2.02	0.41
1:A:504:SER:CB	1:A:515:PRO:HD2	2.51	0.41
1:A:595:THR:HA	1:A:596:PRO:HD3	1.83	0.41
2:L:132:SER:CB	2:L:181:THR:HG22	2.51	0.41
3:H:174:ALA:HB1	3:H:181:TYR:CD1	2.56	0.41
1:A:507:ILE:HG22	1:A:511:ILE:HG12	2.02	0.41
1:A:543:GLU:OE1	1:A:544:PRO:HD2	2.20	0.41
2:L:97:LEU:HD12	3:H:47:TRP:NE1	2.36	0.41
1:A:82:TYR:CZ	1:A:342:TYR:HB2	2.57	0.40
1:A:460:LEU:O	1:A:464:THR:HG23	2.21	0.40
6:A:603:CLR:H121	6:A:603:CLR:C21	2.49	0.40
1:A:41:ILE:HD12	1:A:351:ILE:CG2	2.51	0.40
1:A:319:PHE:O	5:A:602:42F:H13	2.21	0.40
1:A:370:MET:CE	1:A:381:VAL:HB	2.51	0.40
3:H:38:ARG:HB3	3:H:94:TYR:CD2	2.56	0.40
3:H:45:LEU:HD23	3:H:45:LEU:HA	1.97	0.40
3:H:211:LYS:HD2	3:H:211:LYS:N	2.37	0.40
3:H:151:TYR:O	3:H:181:TYR:HB2	2.21	0.40
1:A:30:TRP:NE1	1:A:334:TYR:HB2	2.35	0.40
1:A:127:ILE:HA	1:A:130:TRP:CE3	2.56	0.40
1:A:60:ASN:HB3	1:A:309:VAL:HG22	2.03	0.40
1:A:410:PHE:O	1:A:413:MET:HB3	2.21	0.40
1:A:572:PRO:O	1:A:575:ALA:HB3	2.21	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	533/534 (100%)	509 (96%)	24 (4%)	0	100	100
2	L	211/213 (99%)	200 (95%)	11 (5%)	0	100	100
3	H	217/219 (99%)	210 (97%)	7 (3%)	0	100	100
All	All	961/966 (100%)	919 (96%)	42 (4%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	420/439 (96%)	403 (96%)	17 (4%)	27	55
2	L	178/186 (96%)	174 (98%)	4 (2%)	47	69
3	H	178/187 (95%)	174 (98%)	4 (2%)	47	69
All	All	776/812 (96%)	751 (97%)	25 (3%)	34	61

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	46	ASP
1	A	51	TRP
1	A	101	ARG
1	A	121	ASP
1	A	140	THR

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Mol	Chain	Res	Type
1	A	150	ASN
1	A	205	VAL
1	A	224	ASN
1	A	315	THR
1	A	412	MET
1	A	517	ARG
1	A	518	TYR
1	A	570	MET
1	A	577	PHE
1	A	586	LEU
1	A	590	PHE
1	A	598	ARG
2	L	53	SER
2	L	194	THR
2	L	195	CYS
2	L	210	PHE
3	H	4	LEU
3	H	6	GLU
3	H	134	CYS
3	H	136	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
3	H	202	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.5 Carbohydrates [i](#)

2 monosaccharides are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and



the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	GLC	B	1	4	12,12,12	0.50	0	17,17,17	0.56	0
4	GLC	B	2	4	11,11,12	0.50	0	15,15,17	1.52	2 (13%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GLC	B	1	4	-	0/2/22/22	0/1/1/1
4	GLC	B	2	4	-	1/2/19/22	0/1/1/1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	2	GLC	C1-O5-C5	4.68	118.46	112.19
4	B	2	GLC	O5-C5-C6	2.28	112.11	107.66

There are no chirality outliers.

All (1) torsion outliers are listed below:

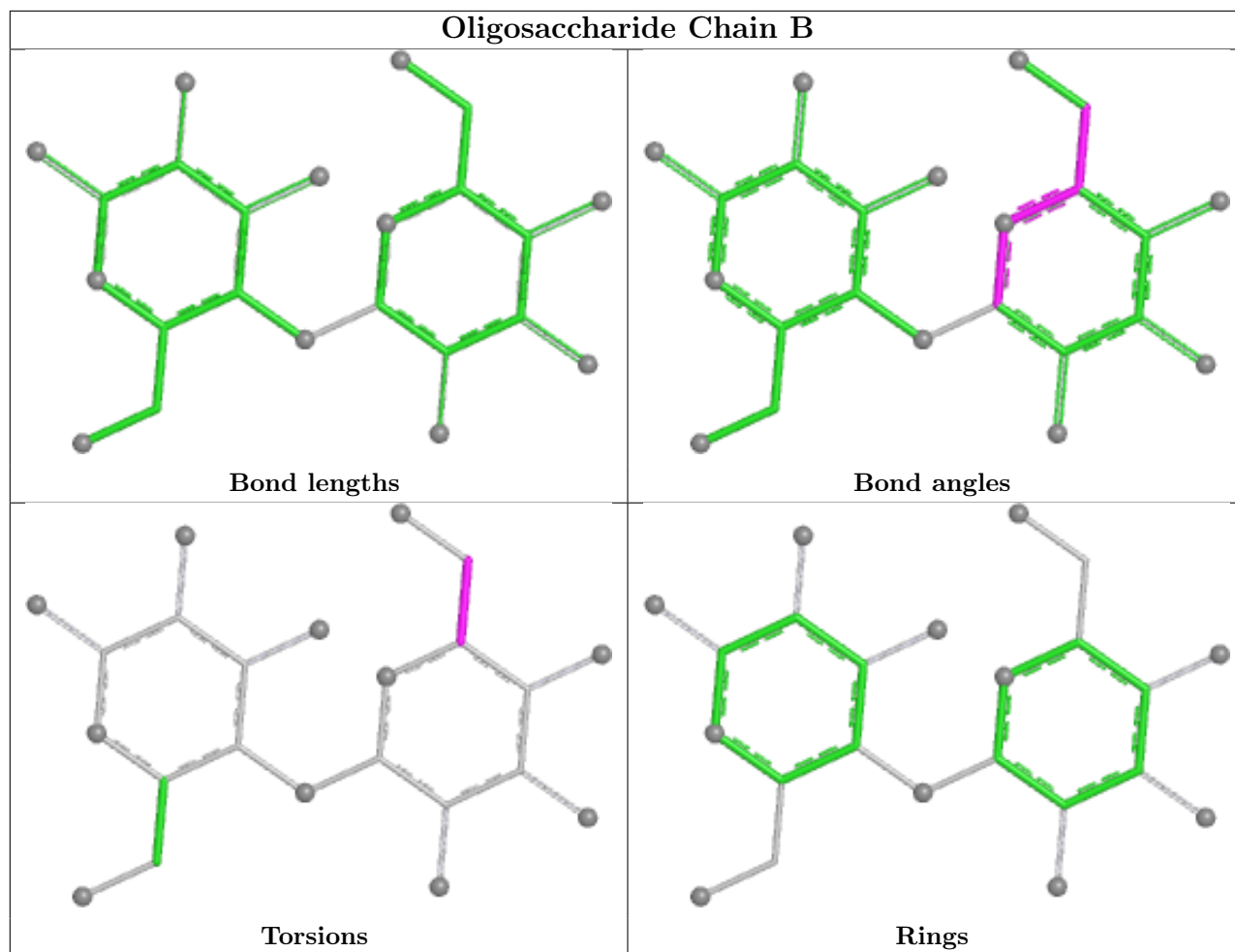
Mol	Chain	Res	Type	Atoms
4	B	2	GLC	O5-C5-C6-O6

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	1	GLC	3	0
4	B	2	GLC	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.



## 5.6 Ligand geometry [i](#)

Of 7 ligands modelled in this entry, 3 are monoatomic - leaving 4 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z  > 2$	Counts	RMSZ	# $ Z  > 2$
7	P4G	A	604	-	10,10,10	0.39	0	9,9,9	0.33	0
6	CLR	A	603	-	31,31,31	0.74	0	48,48,48	1.33	6 (12%)
5	42F	A	602	-	22,22,22	1.84	1 (4%)	29,32,32	1.56	6 (20%)
6	CLR	A	605	-	31,31,31	0.78	0	48,48,48	1.57	7 (14%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	P4G	A	604	-	-	1/8/8/8	-
6	CLR	A	603	-	-	2/10/68/68	0/4/4/4
5	42F	A	602	-	-	2/10/35/35	0/4/3/3
6	CLR	A	605	-	-	1/10/68/68	0/4/4/4

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	602	42F	C8-C6	-7.78	1.40	1.51

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	605	CLR	C4-C5-C10	6.28	124.46	116.42
6	A	603	CLR	C4-C5-C10	4.91	122.71	116.42
5	A	602	42F	C3-C4-N	-3.85	101.22	105.18
6	A	605	CLR	C10-C5-C6	-3.61	117.66	122.93
5	A	602	42F	C7-C1-N	3.10	111.77	107.54
6	A	603	CLR	C13-C17-C20	-2.99	114.88	119.50
5	A	602	42F	C15-O1-C14	-2.93	109.28	115.92
6	A	605	CLR	C13-C17-C20	-2.77	115.22	119.50
6	A	605	CLR	C7-C6-C5	-2.71	120.44	125.02
5	A	602	42F	O1-C14-C5	2.67	114.83	111.03
6	A	603	CLR	C11-C12-C13	-2.52	108.49	112.74
6	A	603	CLR	C8-C7-C6	-2.40	109.44	112.76
6	A	603	CLR	C4-C5-C6	-2.24	117.53	120.57
6	A	603	CLR	C10-C5-C6	-2.21	119.71	122.93
5	A	602	42F	O-C14-C5	-2.19	120.94	125.01
5	A	602	42F	C-N-C1	-2.18	108.08	113.21
6	A	605	CLR	C11-C12-C13	-2.03	109.32	112.74
6	A	605	CLR	C3-C4-C5	2.02	115.27	112.05
6	A	605	CLR	C13-C14-C8	-2.00	111.57	114.41

There are no chirality outliers.

All (6) torsion outliers are listed below:

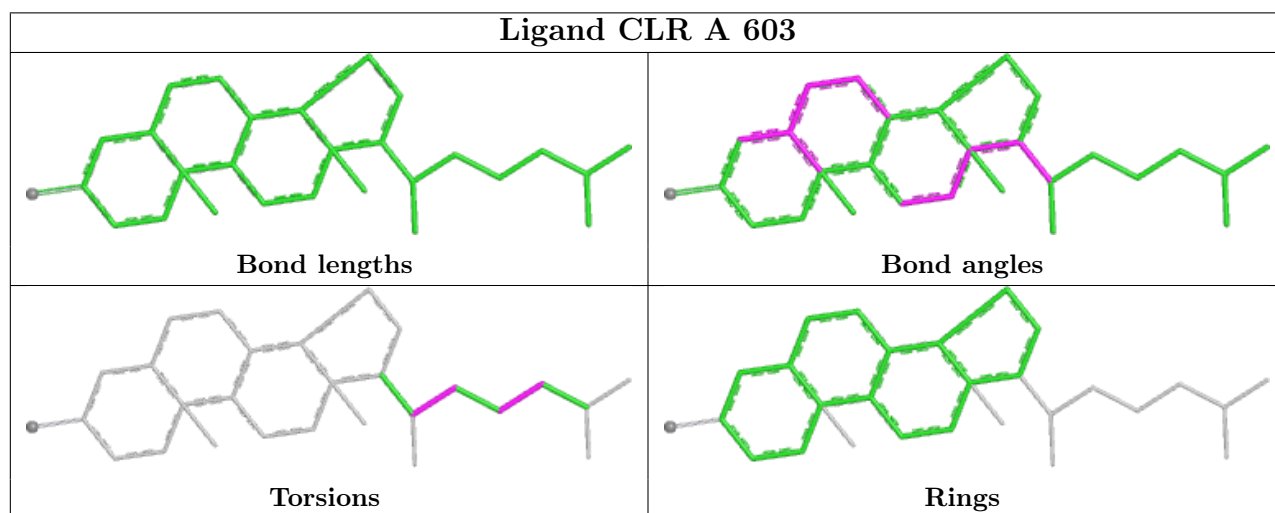
Mol	Chain	Res	Type	Atoms
5	A	602	42F	C5-C14-O1-C15
5	A	602	42F	O-C14-O1-C15
6	A	603	CLR	C21-C20-C22-C23
7	A	604	P4G	O3-C5-C6-O4
6	A	605	CLR	C22-C23-C24-C25
6	A	603	CLR	C22-C23-C24-C25

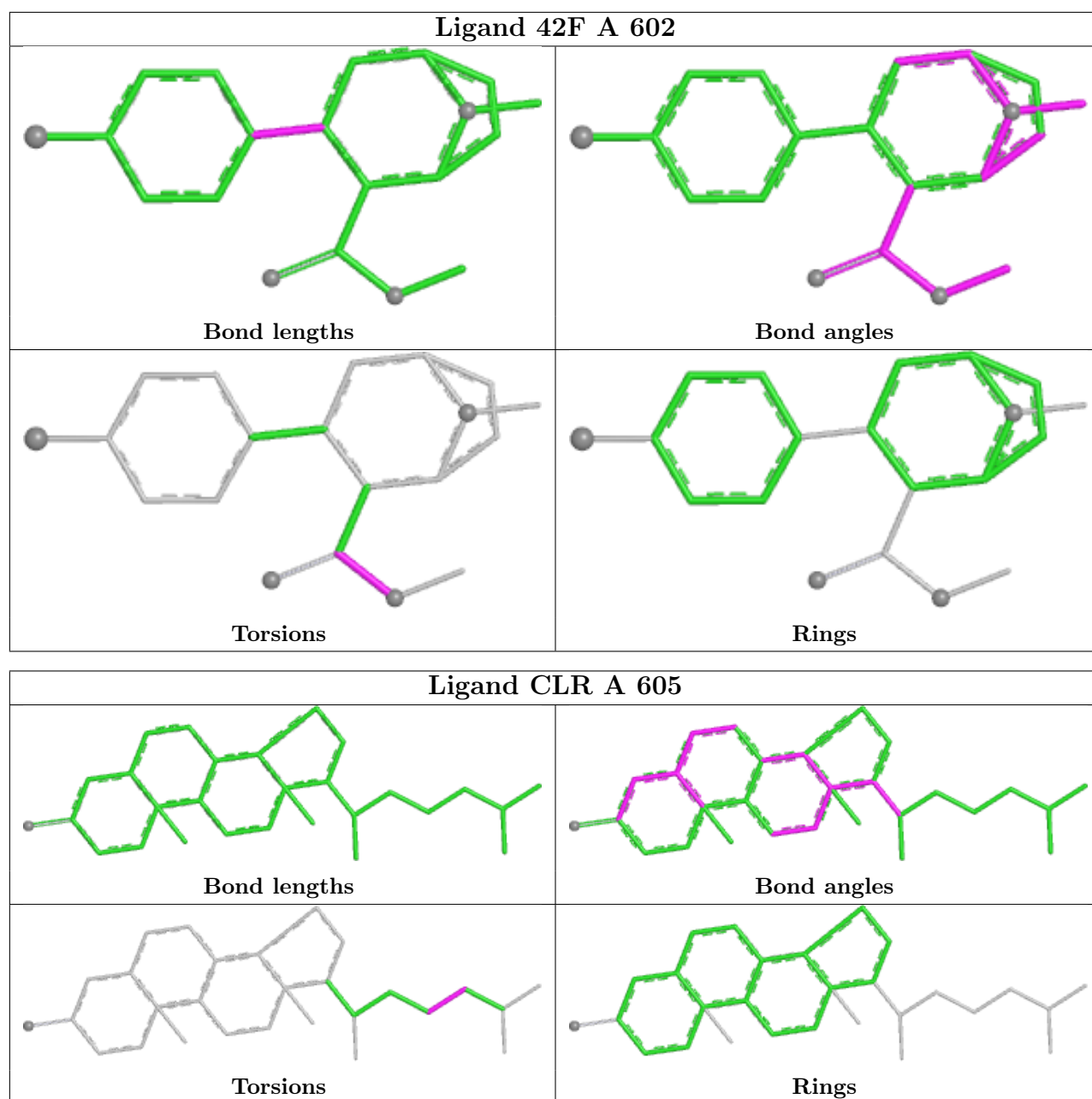
There are no ring outliers.

3 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	A	603	CLR	8	0
5	A	602	42F	3	0
6	A	605	CLR	6	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	534/534 (100%)	0.55	42 (7%) 20 18	47, 69, 92, 113	1 (0%)
2	L	213/213 (100%)	0.82	25 (11%) 10 11	52, 73, 101, 108	0
3	H	219/219 (100%)	0.67	21 (9%) 15 14	51, 69, 114, 142	0
All	All	966/966 (100%)	0.64	88 (9%) 16 15	47, 70, 100, 142	1 (0%)

All (88) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	L	154	SER	7.8
1	A	501	ASN	6.7
2	L	153	GLY	6.4
3	H	138	THR	5.9
1	A	496[A]	TRP	5.3
2	L	192	SER	5.2
1	A	123	TYR	4.6
2	L	53	SER	4.4
2	L	210	PHE	4.1
3	H	142	VAL	4.0
3	H	188	THR	3.8
2	L	158	ASN	3.6
3	H	137	THR	3.6
1	A	479	ALA	3.5
3	H	216	ILE	3.5
1	A	39	SER	3.4
2	L	50	TYR	3.3
3	H	133	VAL	3.2
1	A	599	ASP	3.1
3	H	57	TYR	3.1
3	H	139	GLY	3.1
1	A	149	ASN	3.0
1	A	422	SER	3.0

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	331	TYR	3.0
3	H	55	GLY	3.0
1	A	500	THR	3.0
2	L	101	SER	3.0
2	L	159	GLY	2.9
1	A	227	GLU	2.9
1	A	261	SER	2.9
3	H	104	ARG	2.9
1	A	248	LEU	2.9
2	L	54	ASN	2.9
1	A	498	TYR	2.9
1	A	481	TYR	2.8
3	H	141	SER	2.8
1	A	590	PHE	2.8
2	L	55	LEU	2.8
2	L	155	GLU	2.7
2	L	56	ALA	2.7
1	A	33	LYS	2.7
1	A	598	ARG	2.7
2	L	124	GLU	2.6
2	L	169	SER	2.6
1	A	258	ILE	2.6
3	H	30	SER	2.6
1	A	322	GLY	2.6
3	H	167	SER	2.6
1	A	505	GLU	2.6
1	A	588	GLN	2.5
3	H	111	GLN	2.5
1	A	520	GLN	2.5
1	A	577	PHE	2.5
2	L	119	PHE	2.5
2	L	196	GLU	2.5
1	A	495	SER	2.4
1	A	208	PHE	2.4
2	L	178	SER	2.4
1	A	255	TRP	2.4
2	L	57	SER	2.3
2	L	181	THR	2.3
1	A	206	GLU	2.3
2	L	126	LEU	2.2
3	H	189	VAL	2.2
1	A	319	PHE	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	209	GLN	2.2
3	H	168	GLY	2.2
1	A	290	PHE	2.2
3	H	31	SER	2.2
1	A	82	TYR	2.2
1	A	32	GLY	2.1
3	H	56	ARG	2.1
2	L	93	SER	2.1
3	H	198	SER	2.1
3	H	143	THR	2.1
1	A	93	LYS	2.1
3	H	215	LYS	2.1
1	A	543	GLU	2.1
1	A	480	GLY	2.1
2	L	41	SER	2.1
1	A	494	VAL	2.1
1	A	326	GLY	2.0
2	L	127	THR	2.0
2	L	123	SER	2.0
1	A	37	LEU	2.0
1	A	321	LEU	2.0
1	A	595	THR	2.0
1	A	141	ASN	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

## 6.3 Carbohydrates [i](#)

SUGAR-RSR INFOmissingINFO

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

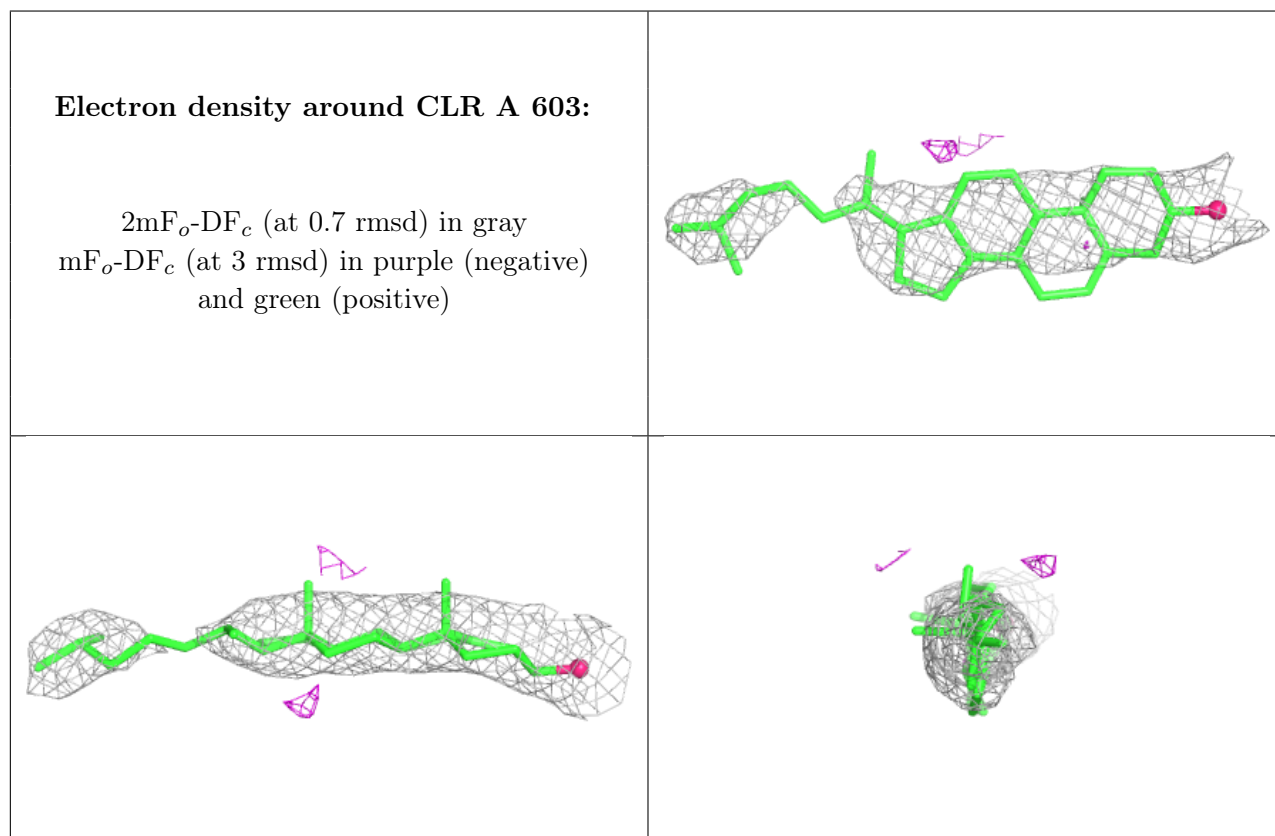
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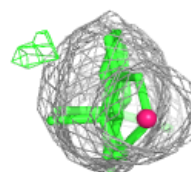
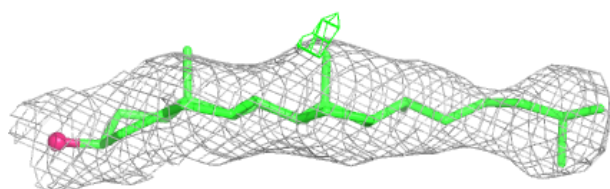
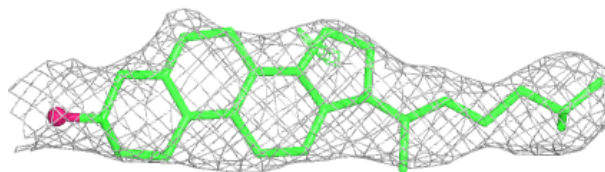
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
7	P4G	A	604	11/11	0.80	0.30	91,112,131,134	0
6	CLR	A	603	28/28	0.88	0.17	49,73,83,84	0
6	CLR	A	605	28/28	0.92	0.14	51,60,66,67	0
8	NA	A	606	1/1	0.93	0.12	66,66,66,66	0
8	NA	A	608	1/1	0.95	0.11	67,67,67,67	0
9	CL	A	607	1/1	0.97	0.29	76,76,76,76	0
5	42F	A	602	20/20	0.98	0.11	58,67,73,106	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

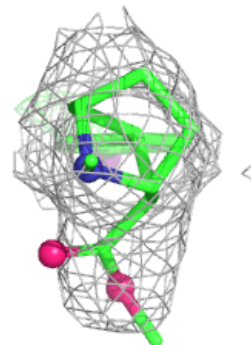
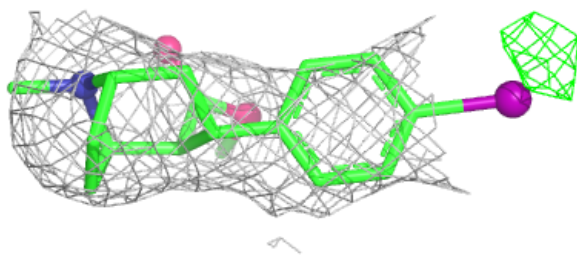
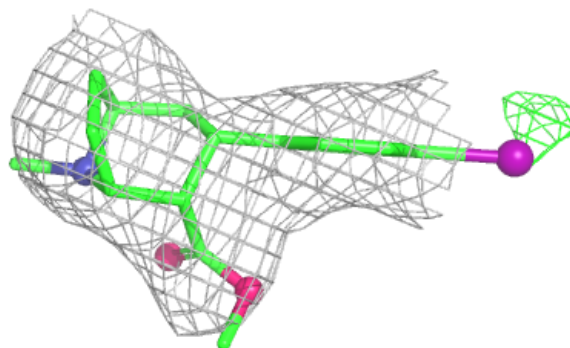


**Electron density around CLR A 605:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around 42F A 602:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



## 6.5 Other polymers [i](#)

There are no such residues in this entry.